UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
AIR AND RADIATION

The Honorable Andy Harris, M.D.
U.S. House of Representatives
Chairman, Subcommittee on Energy and Environment
Washington, D.C. 20515

Dear Chairman Harris:

Thank you for your letter of September 22, 2011, in which you ask several questions regarding the Environmental Protection Agency's (EPA) Cross-State Air Pollution Rule (CSAPR) as a follow-up to the Science, Space, and Technology Committee's September 15 hearing on this topic. I appreciate the opportunity to provide the additional information you have requested.

With regard to EPA's estimates of avoided premature mortality under CSAPR, EPA estimated the number of fine particle ($PM_{2.5}$)-related deaths avoided due to the implementation of this rule using two long-term prospective cohort studies. The first study is the extended analysis of the American Cancer Society cohort by Pope and colleagues published in 2002.[1] The second is an extended analysis of the Harvard Six Cities cohort by Laden and colleagues published in 2006.[2] There are strengths to each study that argue for using both as the basis for the PM mortality estimates in CSAPR. In particular, the Harvard Six Cities cohort is located in cities in the eastern United States, which is the geographic area covered by CSAPR, and the demographic characteristics of this cohort are representative of the broader U.S. population. The American Cancer Society cohort is larger than the Six Cities cohort and covers a broader number of urban areas across the United States. Using these studies, we reported two estimates of $PM_{2.5}$-related mortality: 13,000 (95% confidence intervals from 5,200 to 21,000) using the Pope et al. (2002) study and 34,000 (95% confidence intervals from 18,000 to 49,000) using the Laden et al. (2006) study. Thus the phrase "up to 34,000" refers to the higher of the two central estimates from the range of results while communicating that there is uncertainty in the estimates. We did not separately estimate premature mortality impacts for different diseases for the CSAPR. We quantify all-cause mortality rather than cardiopulmonary or lung cancer mortality specifically because it is the most comprehensive estimate of PM-related mortality as supported by the scientific literature.

The EPA's Regulatory Impact Analysis[3] for CSAPR describes in detail the methods and data we employed to quantify these impacts as well as a suite of sensitivity and uncertainty analyses. Our

[1] Pope, C.A., III, R.T. Burnett, M.J. Thun, E.E. Calle, D. Krewski, K. Ito, and G.D. Thurston.2002. "Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution." *Journal of the American Medical Association* 287:1132-1141.

[2] Laden, F., J. Schwartz, F.E. Speizer, and D.W. Dockery. 2006. "Reduction in Fine Particulate Air Pollution and Mortality." *American Journal of Respiratory and Critical Care Medicine* 173:667-672.

[3] http://www.epa.gov/airtransport/pdfs/FinalRIA.pdf

approach to quantifying the benefits of air quality improvements in general, and our reliance on the two studies mentioned above in particular, has been thoroughly reviewed by independent scientific bodies including the National Research Council[4] and Advisory Council on Clean Air Compliance Analysis.[5] EPA did not perform a Quality Adjusted Life Years (QALY) analysis for the Cross State Rule due to continuing methodological concerns about the approach.

With regard to your questions about the number of avoided premature deaths and other health benefits estimated by EPA in analyses for CSAPR and other recent Clean Air Act Rules, EPA has prepared a summary table (below) with links to the Regulatory Impact Analysis (RIA) of all Clean Air Act Rules issued since January 20, 2009 that estimated $PM_{2.5}$-related premature deaths. These RIAs provide information on specific health effects (including avoided premature deaths) attributable to each rule as you requested in your letter.

Rule	Link to Document on EPA's Website
Existing Stationary RICE NESHAP	
Proposal Compression Ignition/Spark Ignition RIA (2/27/2009)	http://www.epa.gov/ttn/ecas/regdata/RIAs/riceproposalriafinalversion.pdf
Final Compression Ignition RIA (2/22/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/CIRICENESHAPRIA2-17-10cleanpublication.pdf
Final Spark Ignition RIA (8/10/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/riceriafinal.pdf
Cement NESHAP and NSPS	
Proposal RIA (4/21/2009)	http://www.epa.gov/ttn/ecas/regdata/RIAs/portlandcementria_4-20-09.pdf
Final RIA (8/9/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/portlandcementfinalria.pdf
C3 Marine Rule	
Proposal RIA (6/1/2009)	http://www.epa.gov/otaq/regs/nonroad/marine/ci/420d09002.pdf
Final RIA (12/1/2009)	http://www.epa.gov/otaq/regs/nonroad/marine/ci/420r09019.pdf
NO_2 NAAQS	
Proposal RIA (7/2/2009)	http://www.epa.gov/ttn/ecas/regdata/RIAs/proposedno2ria.pdf
Final RIA (1/22/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/FinalNO2RIAfulldocument.pdf
2012-16 Light Duty Vehicle Rule	
Proposal RIA (9/29/2009)	http://www.epa.gov/otaq/climate/regulations/420d09003.pdf
Final RIA (5/7/2010)	http://www.epa.gov/otaq/climate/regulations/420r10009.pdf
SO_2 NAAQS	

[4] National Research Council. 2002. *Estimating the Public Health Benefits of Proposed Air Pollution Regulations*. Committee on Estimating the Health-Risk-Reduction Benefits of Proposed Air Pollution Regulations. Washington, D.C.: National Academies.

[5] Advisory Council on Clean Air Compliance Analysis, 2010. *Review of EPA's DRAFT Health Benefits of the Second Section 812 Prospective Study of the Clean Air Act*. EPA-COUNCIL-10-001. June. Available on the Internet at http://yosemite.epa.gov/sab/sabproduct.nsf/0/72D4EFA39E48CDB2852577450073877 6/$File/EPA-COUNCIL-10-001-unsigned.pdf

Proposal RIA (11/16/2009)	http://www.epa.gov/ttn/ecas/regdata/RIAs/pso2full11-16-09.pdf
Final RIA (6/2/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/fso2ria100602full.pdf
Ozone NAAQS Reconsideration Proposal	
Proposal RIA (1/6/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/s1-supplemental_analysis_full.pdf
Boiler NESHAP and Area Source Rule	
Proposal RIA (5/6/2010)	http://www.epa.gov/airquality/combustion/docs/boilerria20100429.pdf
Final RIA (2/23/2011)	http://www.epa.gov/ttn/ecas/regdata/RIAs/boilersriafinal110221_psg.pdf
Solid Waste Incineration Units NSPS and Emission Guidelines	
Proposal RIA (5/6/2010)	http://www.epa.gov/airquality/combustion/docs/ciswiria20100429.pdf
Final RIA (2/23/2011)	http://www.epa.gov/ttn/ecas/regdata/RIAs/CISWIRIAfinal110221_psg2.pdf
Cross-State Air Pollution Rule	
Proposal RIA (7/6/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/proposaltrria_final.pdf
Final RIA (7/12/2011)	http://www.epa.gov/airtransport/pdfs/FinalRIA.pdf
2014-18 Heavy Duty Vehicle Rule	
Proposal RIA (11/30/2010)	http://www.epa.gov/otaq/climate/regulations/420d10901.pdf
Final RIA (8/9/2011)	http://www.epa.gov/otaq/climate/documents/420r11901.pdf
Sewage Sludge Incineration Units NSPS and Emission Guidelines	
Proposal RIA (10/4/2010)	http://www.epa.gov/ttn/ecas/regdata/RIAs/ssiria.pdf
Final RIA (2/23/2011)	http://www.epa.gov/ttn/ecas/regdata/RIAs/ssiria110201.pdf
Mercury and Air Toxics Standards (Utility NESHAP and NSPS)	
Proposal RIA (3/21/2011)	http://www.epa.gov/ttn/ecas/regdata/RIAs/ToxicsRuleRIA.pdf
Chlor Alkali Plants NESHAP	
Proposal RIA (6/29/2011)	http://www.epa.gov/ttn/ecas/regdata/RIAs/mercurycell.pdf
Ferroalloys RTR	
Proposal RIA (11/8/2011)	http://www.epa.gov/ttn/ecas/regdata/RIAs/eo12866_ferroalloys_ria_2060_aq11finalforproposal.pdf

With regard to the final question in your letter about my testimony regarding the availability of the scientific support for EPA's estimates of avoided premature deaths under CSAPR, there are numerous relevant documents that are publicly available and that have been through public comment and review. As is the case for all our significant rules, the basis for our benefits estimates for the Cross State Rule is set forth in the Regulatory Impact Analysis (RIA). [6] Chapters 3 and 4 discuss our analysis of the Cross State Rule's projected effect on emissions and air quality. That information then feeds into the benefits assessment, which is contained in Chapter 5. The benefits chapter alone runs approximately 250 pages, including 25 pages of references. This RIA went through the usual thorough vetting to which all RIAs

[6] http://www.epa.gov/airtransport/pdfs/FinalRIA.pdf

are subject. After undergoing inter-agency review under the auspices of the Office of Management and Budget (OMB), we release proposed RIAs for public review and comment at the same time that we release the proposed rule. We then review and respond on the record to any significant public comments on the RIA, including the benefits analysis. Draft final RIAs also undergo interagency review before EPA finalizes them.

The scientific studies used by EPA as the basis for estimating public health benefits are evaluated by EPA during the development of the Integrated Scientific Assessments and the Risk/Exposure Assessments that EPA periodically issues for ozone, fine particles and other criteria pollutants pursuant to Sections 108 and 109 of the Clean Air Act. An Integrated Science Assessment is a comprehensive review, synthesis, and evaluation of the most policy-relevant peer-reviewed science, including key science judgments that are important to inform the rest of the review process for setting national ambient air quality standards. The Risk/Exposure Assessment draws upon the corresponding Integrated Science Assessment to characterize exposures and associated risks to human health or the environment associated with recent air quality conditions. These documents are peer reviewed by the independent and statutorily-mandated Clean Air Scientific Advisory Committee (CASAC), in addition to undergoing extensive public review and comment. Although the documents have shorter overview sections, the most recent assessments for particulate matter, for example, contain thousands of pages of analysis based on peer-reviewed scientific studies.[7]

The benefits estimates also rely on rigorous, peer-reviewed methodologies grounded firmly in a vast body of research related to the health effects of air pollution. Our benefits assessment methods have been extensively peer reviewed and supported by the National Academies of Science and several panels of the independent EPA Science Advisory Board.[8]

In response to the new request in your letter regarding the availability of data and analyses from five epidemiological studies (two American Cancer Society studies, the Harvard Six Cities Study, and two Nurses Health studies), we will take action under 2 CFR 215.36 as soon as possible to provide you with any data and analyses produced with EPA funds to the extent that this information remains available.

Again, thank you for your letter. If you have further questions, please contact me or your staff may call Diann Frantz in EPA's Office of Congressional and Intergovernmental Relations at (202) 564-3668.

Sincerely,

Gina McCarthy
Assistant Administrator

[7] http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html
[8] See, e.g., reports cited n. 4 and 5 above.